

Iceland's Energy Story and Europe's Geothermal Potential

Halla Hrund Logadóttir
Director-General
Iceland National Energy Authority









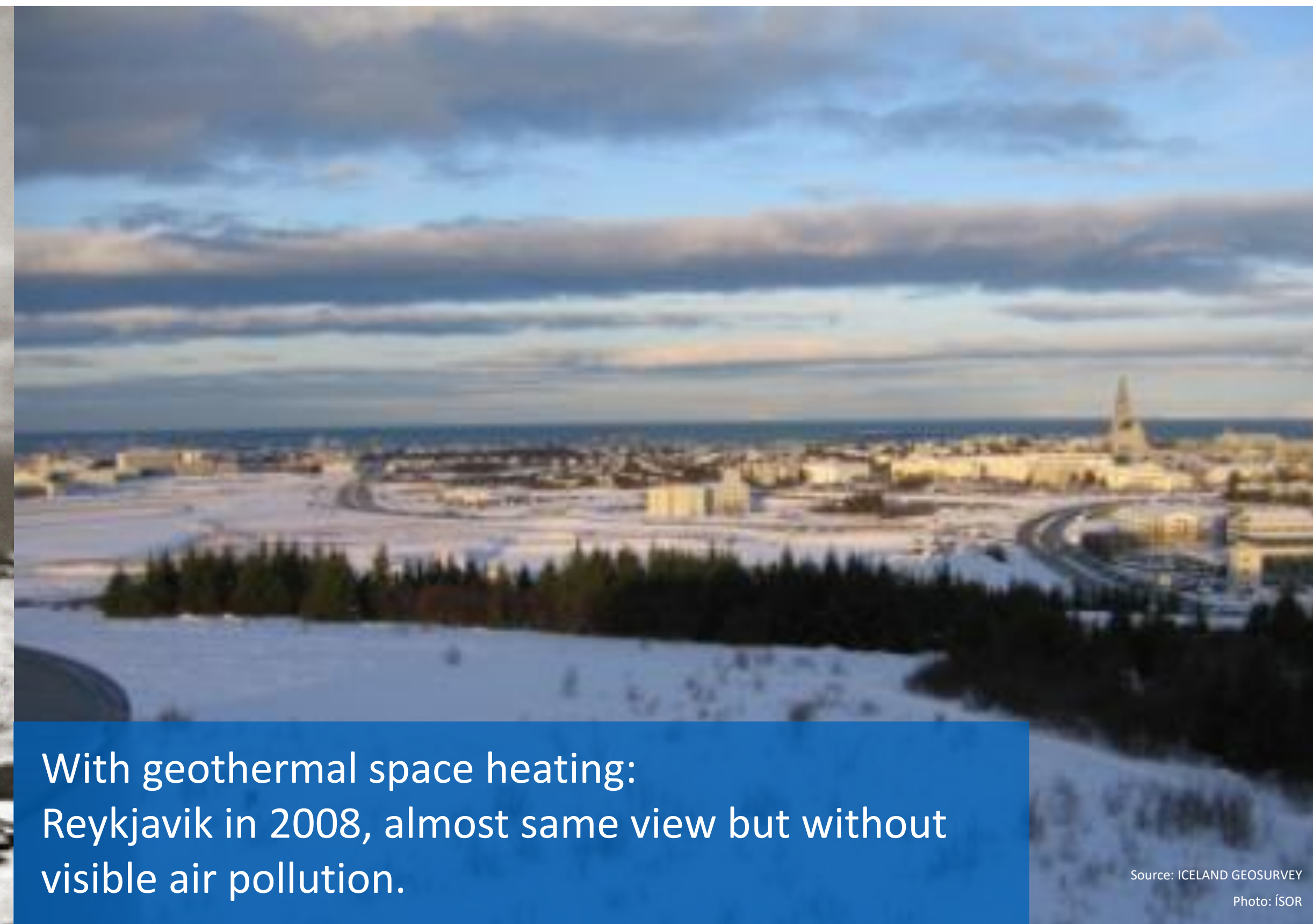
- »» 99,9% of electricity produced from renewables
- »» 90% of houses are heated with geothermal
- »» 85% of primary energy comes from renewables



From fossil fuel to geothermal



Before geothermal space heating:
Reykjavik in 1933 covered with smoke from coal
heating.



With geothermal space heating:
Reykjavik in 2008, almost same view but without
visible air pollution.

HOW DID THIS HAPPEN?

Entrepreneurship

1909

A farmer heats his farm with water from a geothermal hot spring

1914-1918

Fuel shortage during the war puts pressure on politicians





A public school + the main hospital

1938: Vote for geothermal heating!

Before:



After:



1970s OIL CRISES

EXTREMELY HIGH ENERGY COST

1970s OIL CRISES

EXTREMELY HIGH ENERGY COST

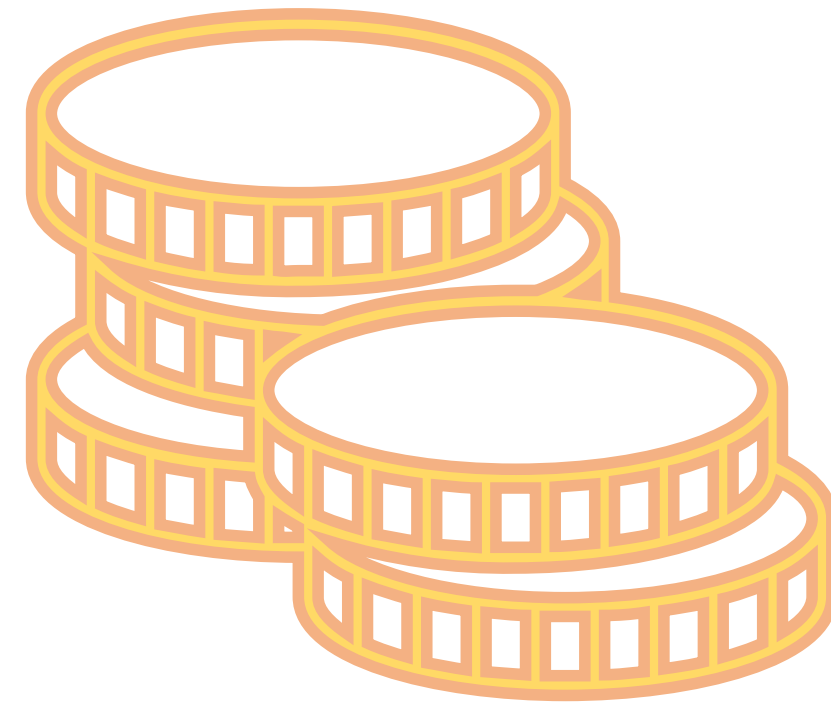
STRONG FOCUS ON DEVELOPING LOCAL ENERGY RESOURCES

Major operation

Iceland one of the poorest nations in Europe

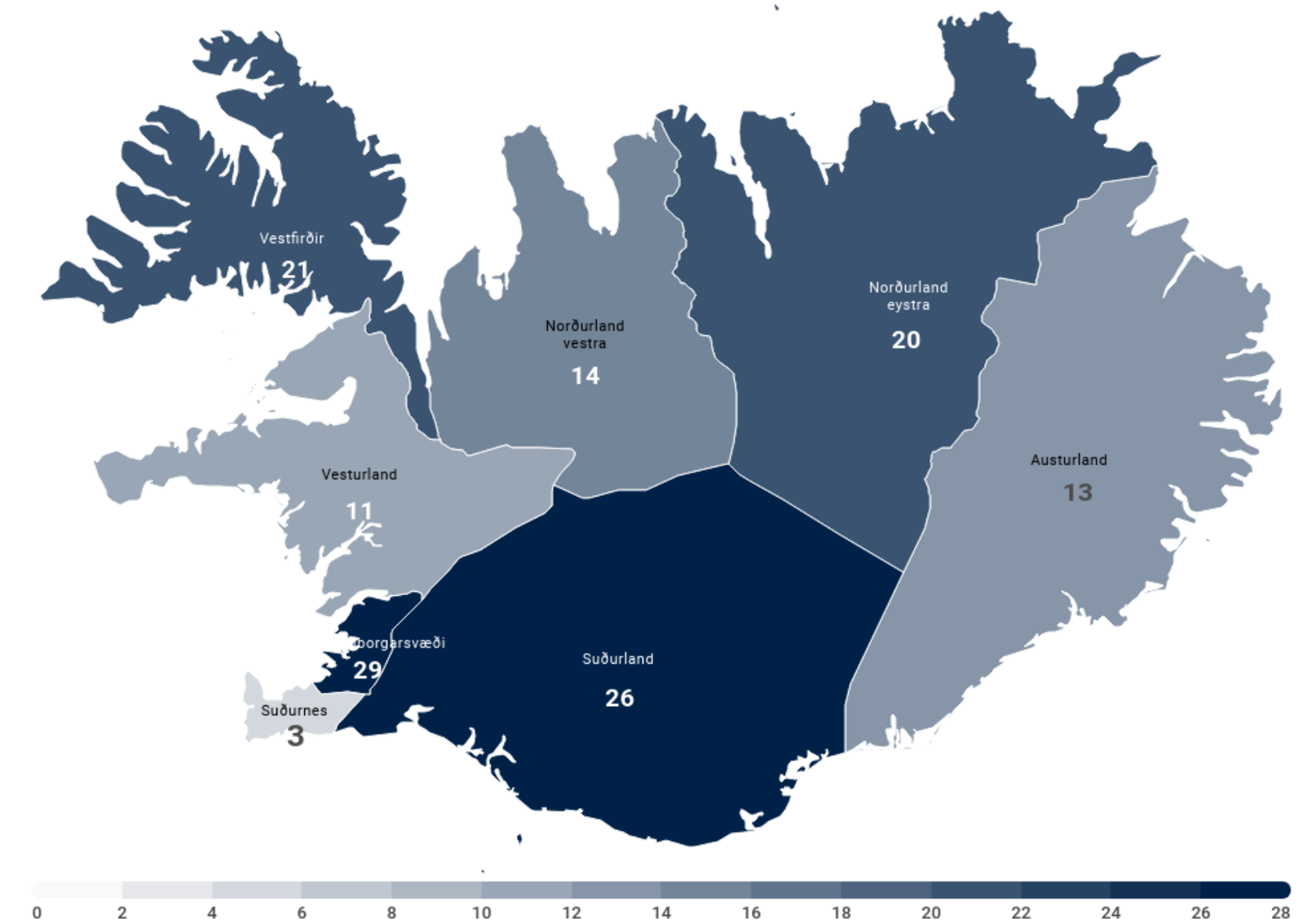


How was this funded?



The case of geothermal

The role of the Icelandic Energy Fund



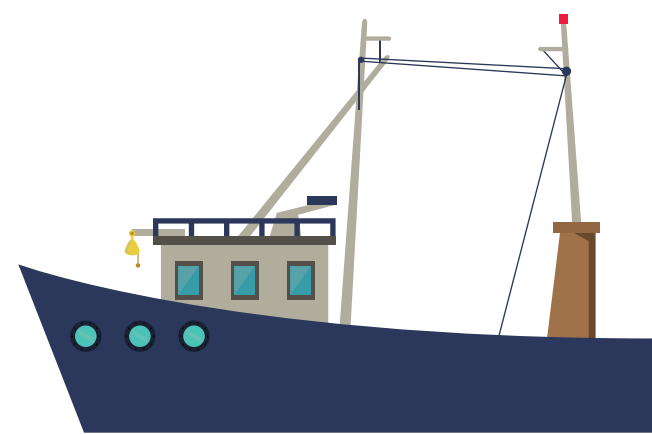
From 1961-1983

Over **350** loans issued around the country and **20** district systems built

The National Energy Fund

E-fuel project examples

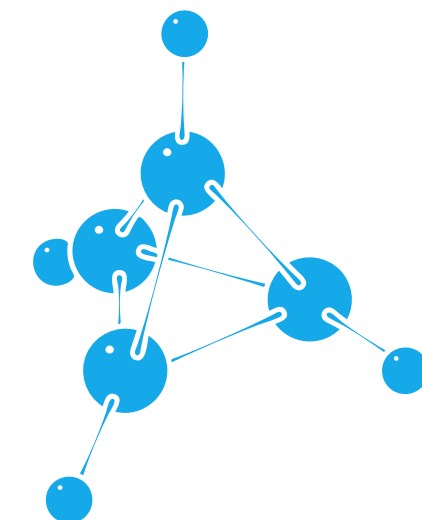
Fishing diesel vessel
retrofitted for
e-methanol use



Two hydrogen projects
for heavy vehicles

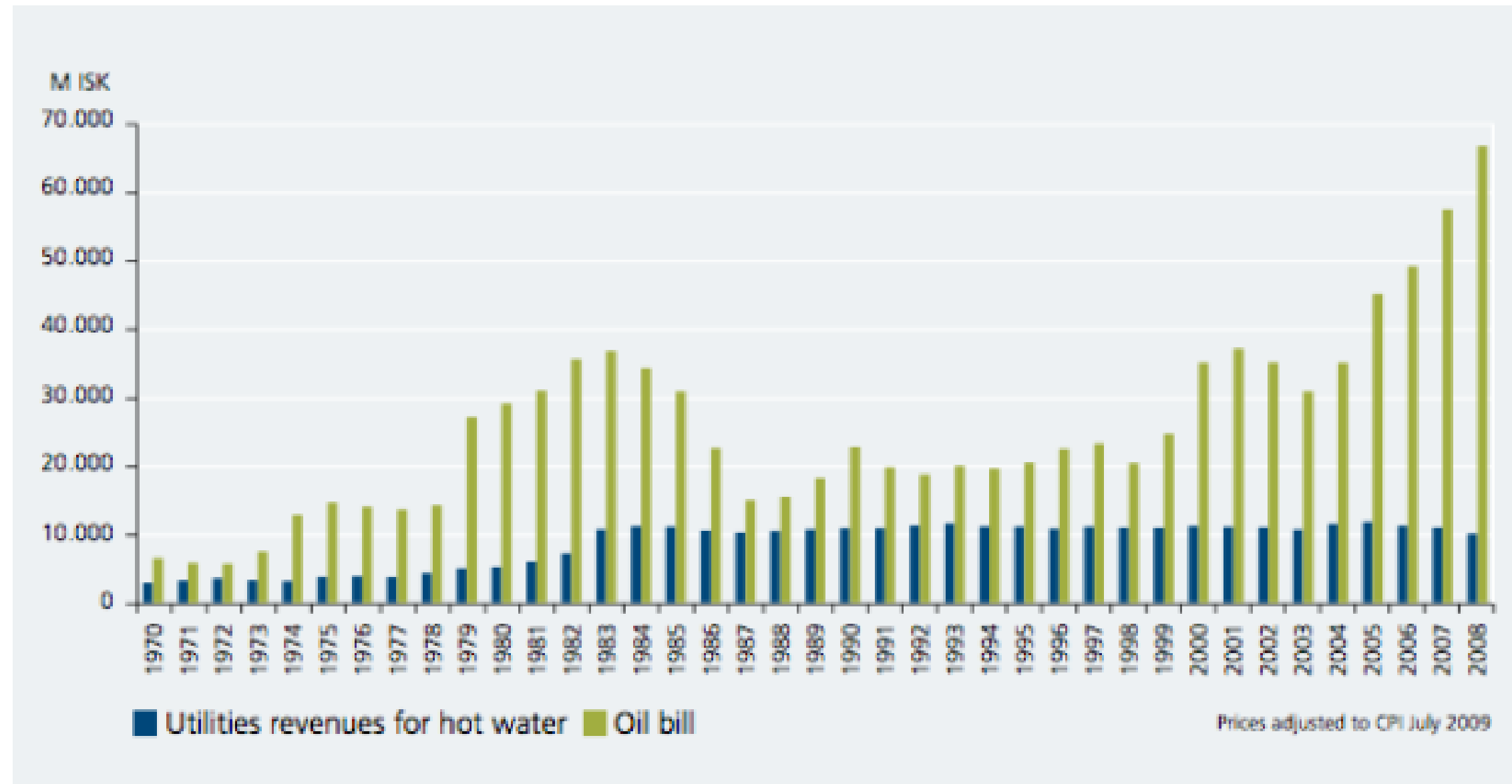


Methanol production



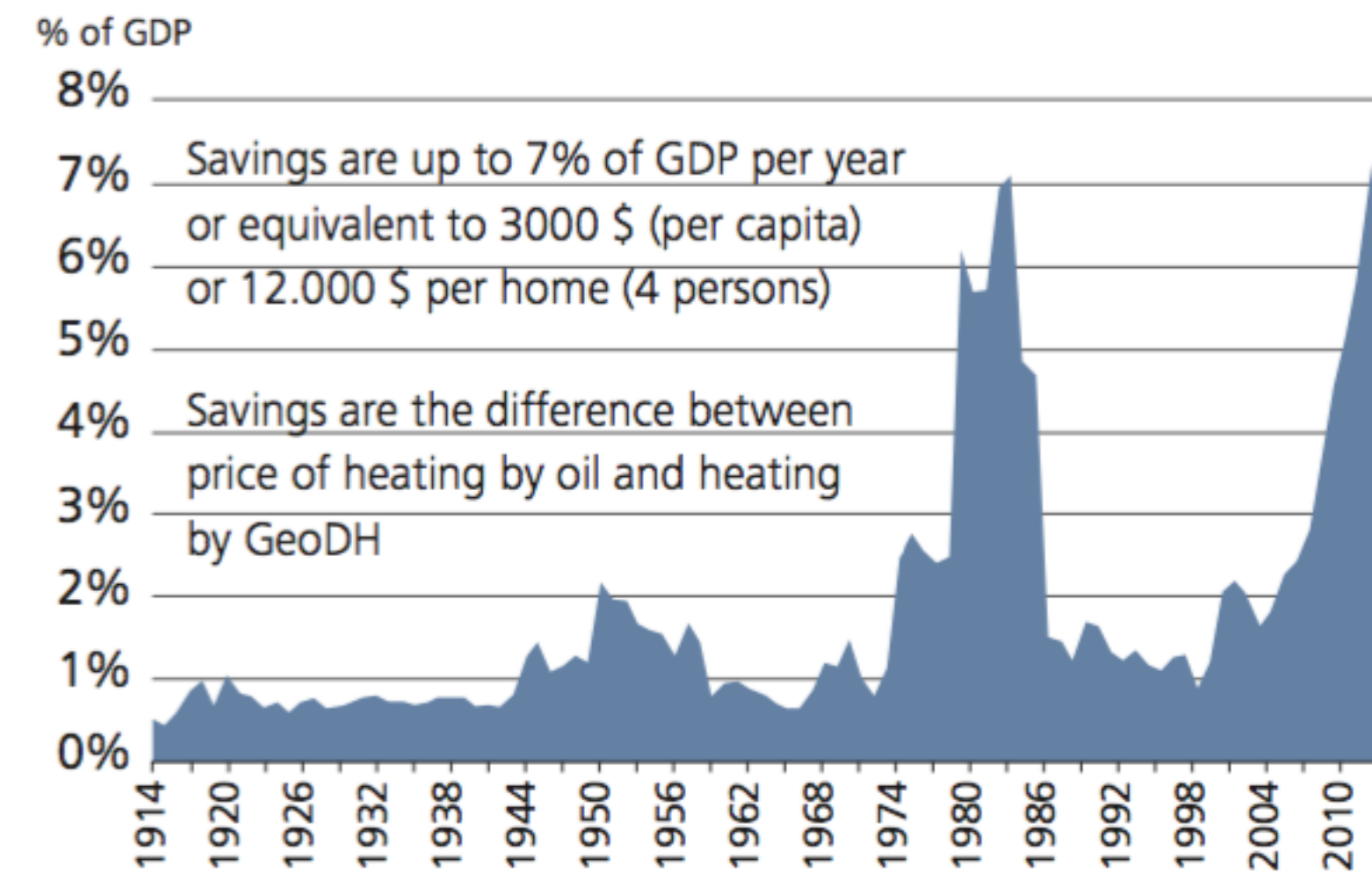


**WAS THIS INVESTMENT IN
GEOHERMAL WORTH IT?**



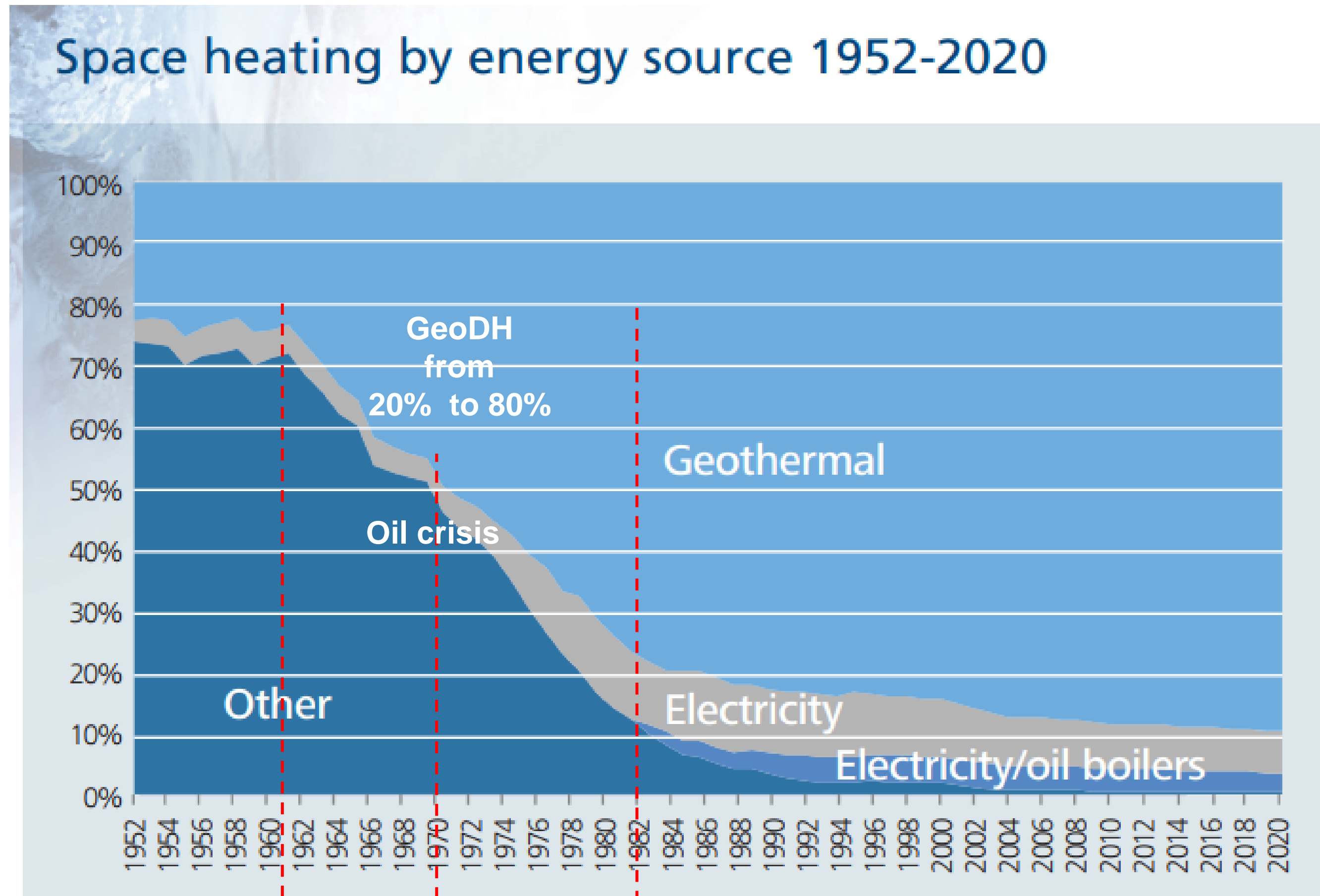
http://www.nea.is/media/utgafa/GD_loka.pdf

Economic Benefits of Geothermal District Heating, as a % of GDP 1914-2013

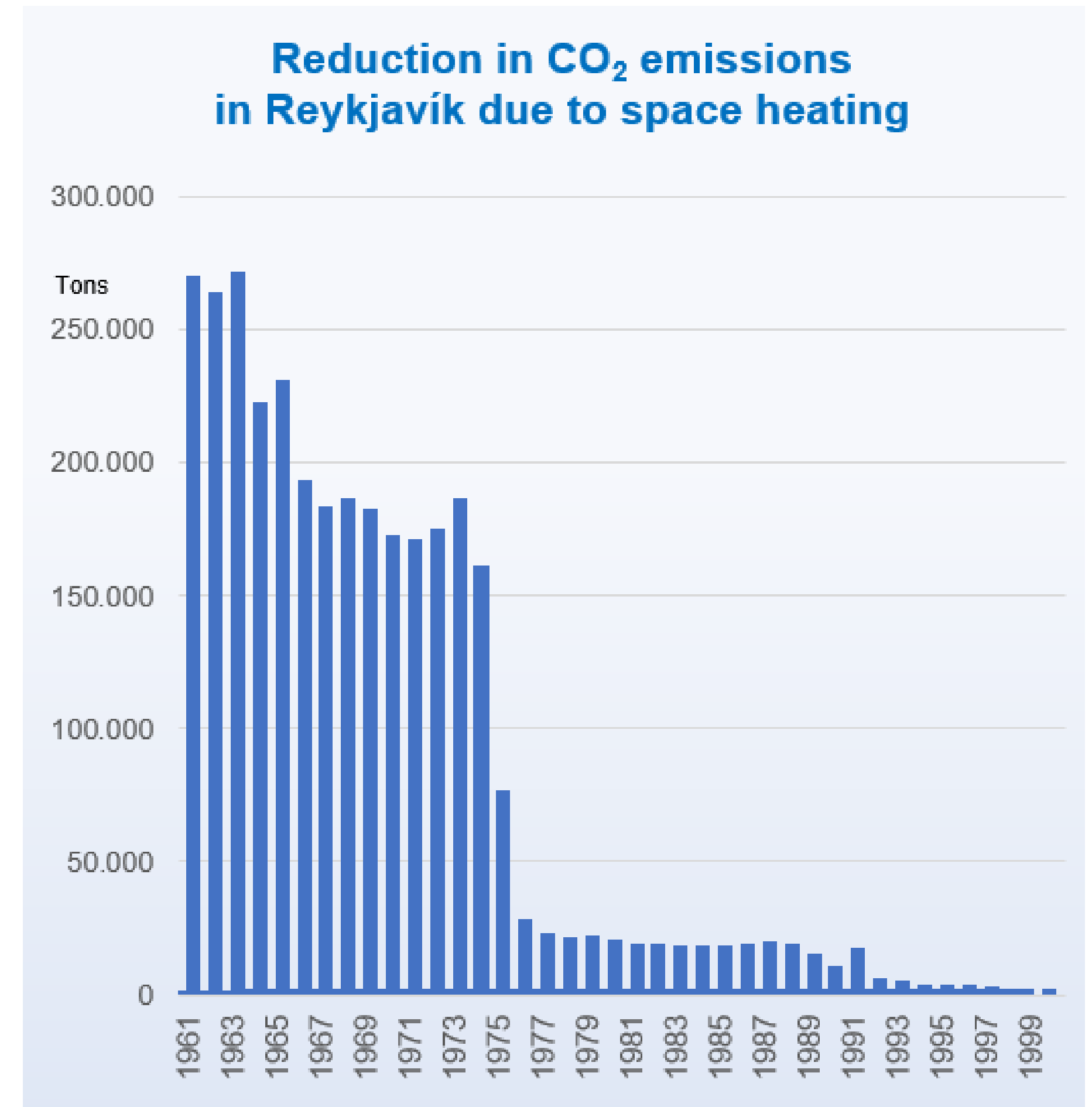


Geothermal development in Iceland

Space heating by source and resulting GHG emissions



Orkustofnun Data Repository: OS - 2021 - T012 - 01



ADDITIONAL BENEFITS?



SWIMMING POOLS



FOOD PRODUCTION

A large indoor hydroponic farm with rows of green plants under artificial lights. The structure is a long, narrow greenhouse with a high, vaulted metal roof. The interior is filled with rows of green plants growing in a hydroponic system. The plants are arranged in long, narrow rows, and the floor is a wooden walkway. The lighting is bright and even, illuminating the entire space. The overall atmosphere is clean and modern, representing a high-tech food production environment.

FISH FARMING

aquaculture





**MOST NORTHERN BANANA
FARMING!**



We turn CO₂ into stone

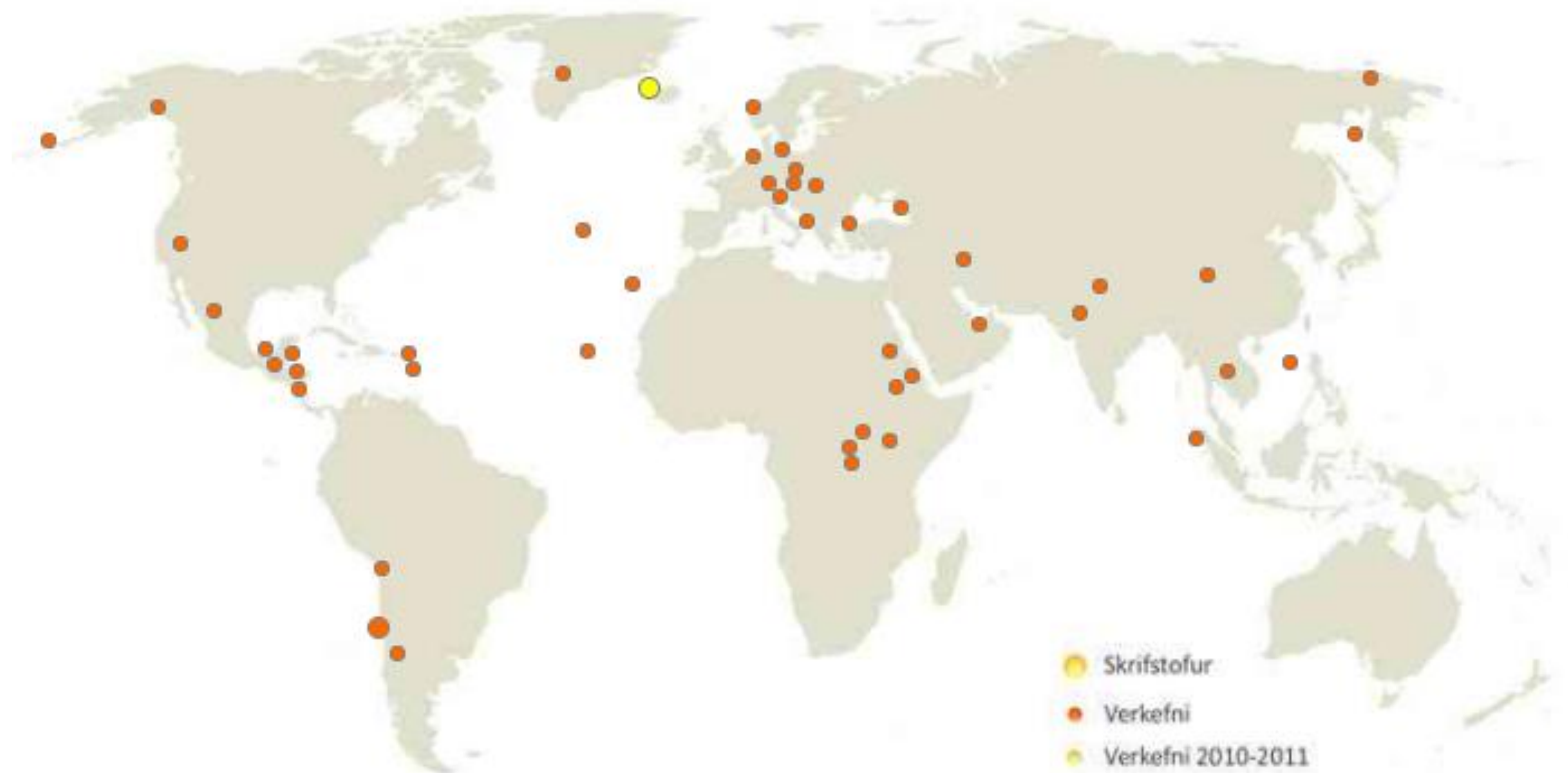
Carbfix provides a natural and permanent storage solution by turning CO₂ into stone underground in less than two years.



14.033

Innovation

EDUCATION AND KNOWLEDGE



DENMARK

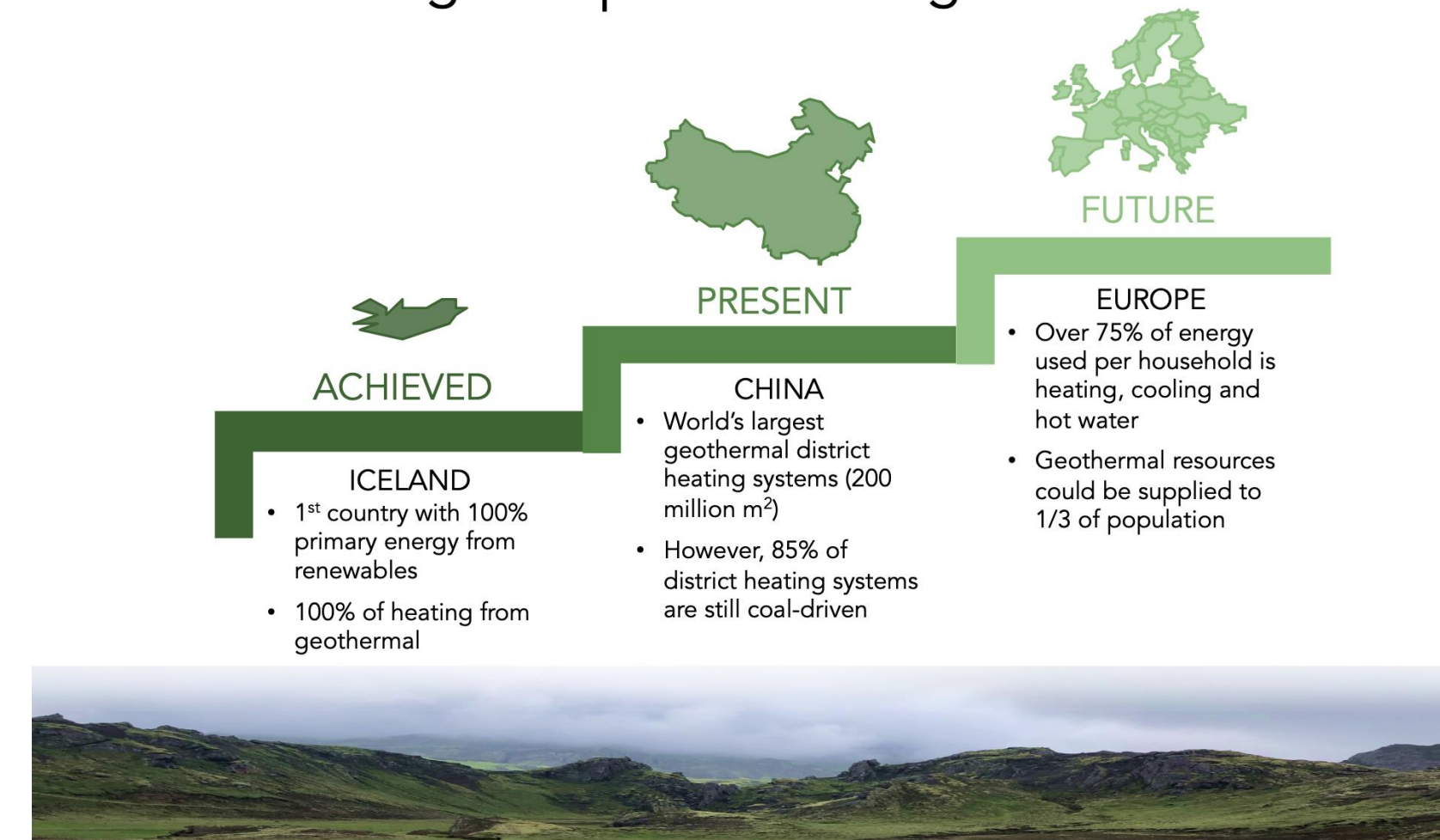


PRESS RELEASE

The International Geothermal Association (IGA) selects The Hague as new operational headquarter

November 10, 2020
Bonn, Germany

Gigantic potential for growth



CHINA

NETHERLANDS

JOIN THE LIVESTREAM | 9 March 2022 | 14:00 - 17:00
Hybrid Conference from the Museum

◆ The City
The Business
The Hague.

EXPERIENCE GEOTHERMAL THE HAGUE

Organised by

The Hague Business Agency | IGA

Powered by

geothermie | ebn | EGEC | ImpccCity | bodemenergie NEDERLAND

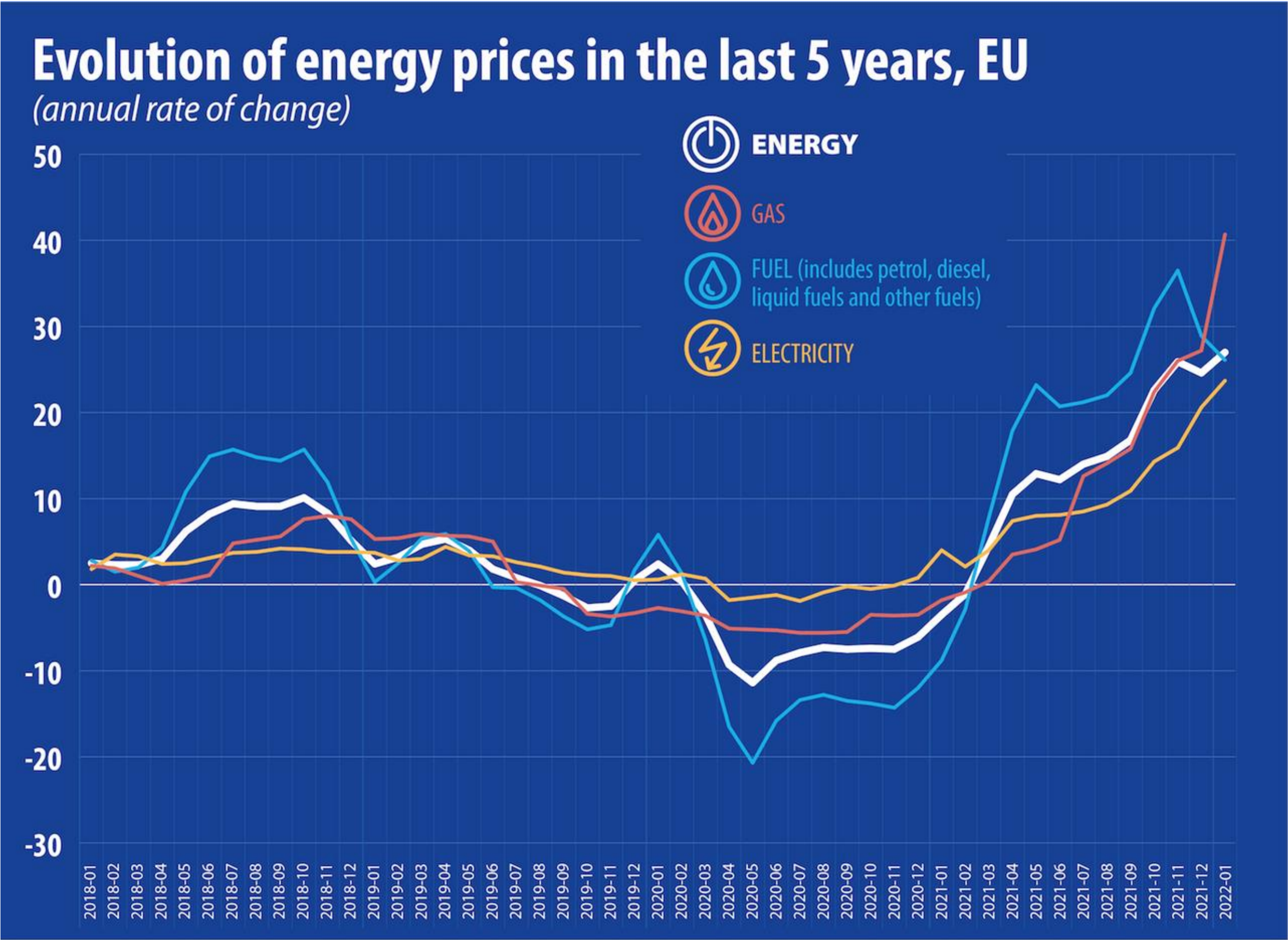


Ukraine

Energy Security

Economic Security

Climate Security



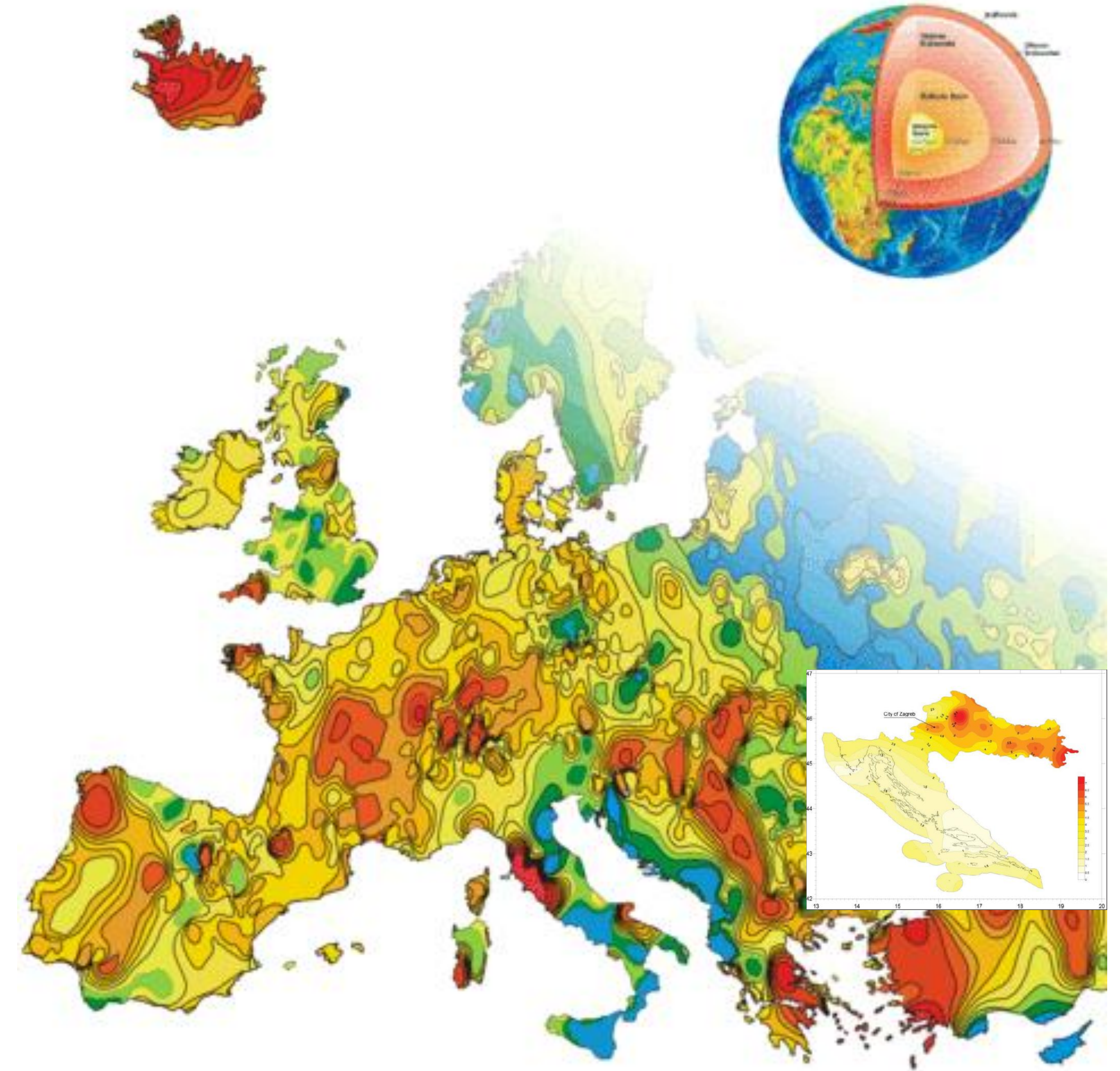
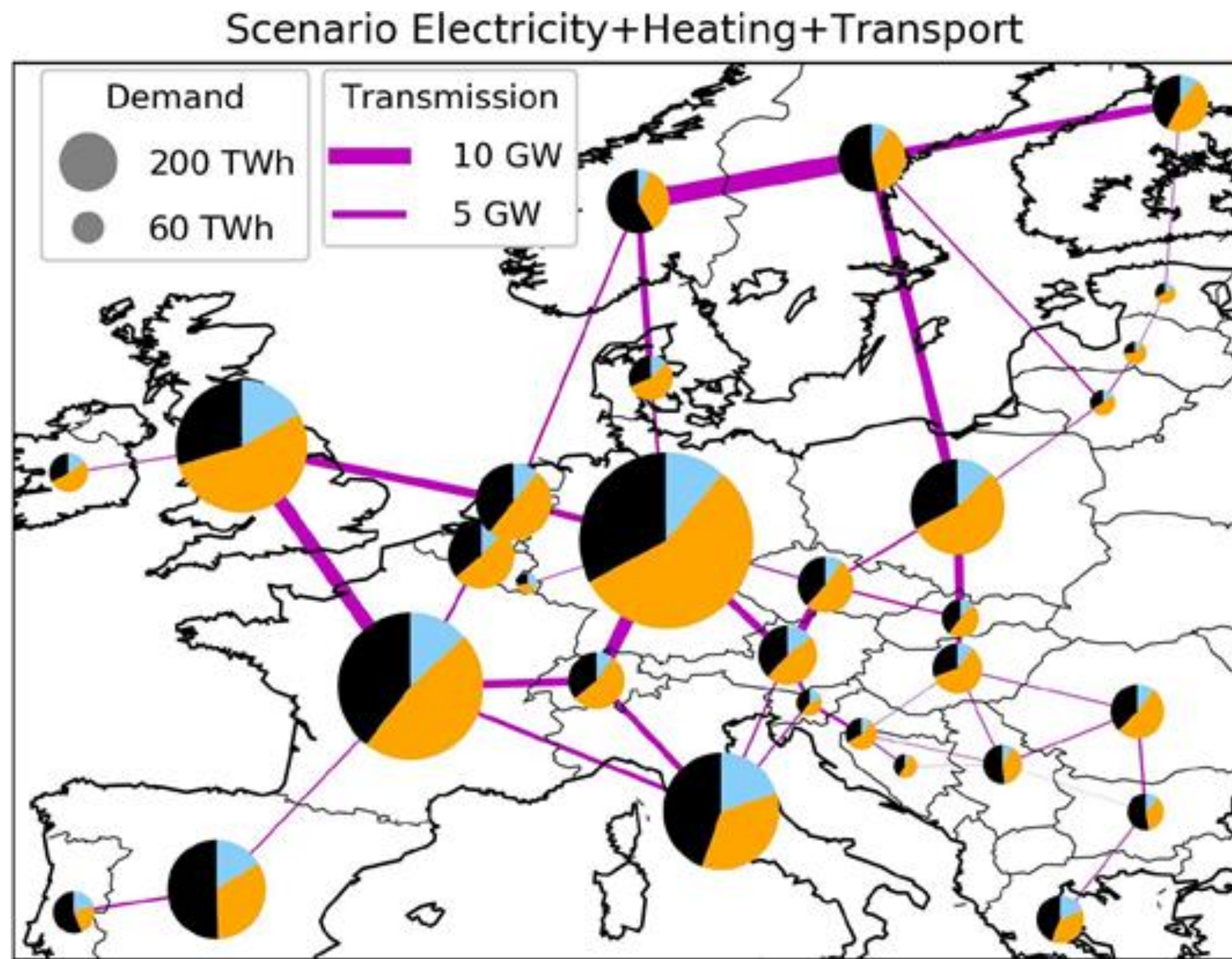
ec.europa.eu/eurostat

Geothermal is an important piece of the puzzle in Europe

Energy security + emissions



Geothermal energy is an indigenous source of energy and contributes to the security of energy supply





4 ideas for collaboration

EEA grants

Iceland 
Liechtenstein
Norway grants

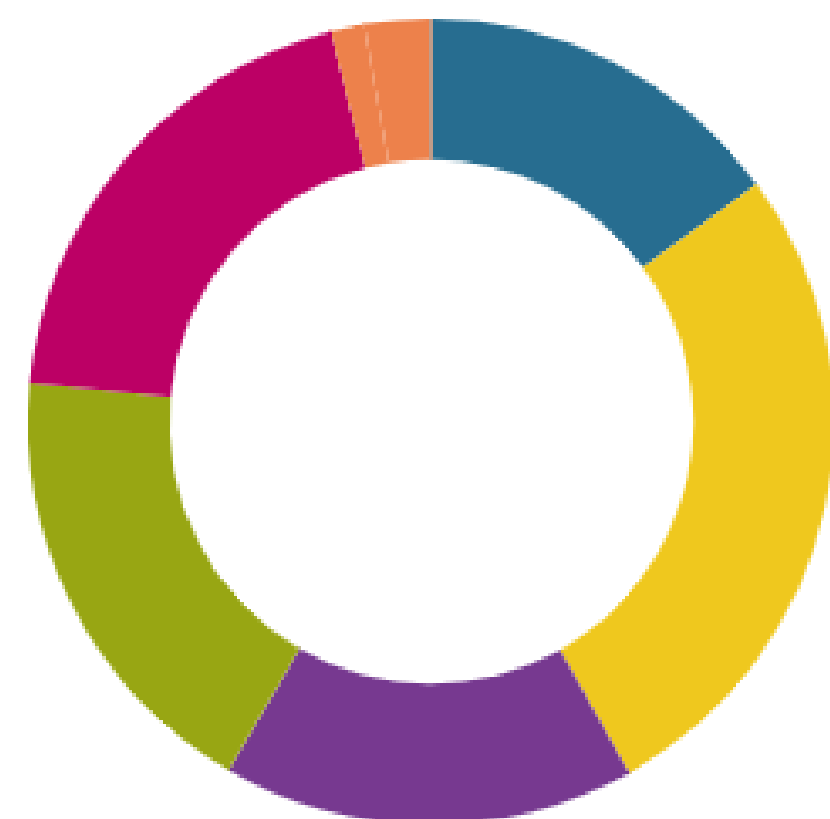
EEA Grant within the EEA Agreement

Projects funding by Financial Mechanism 2014-2021, number of projects

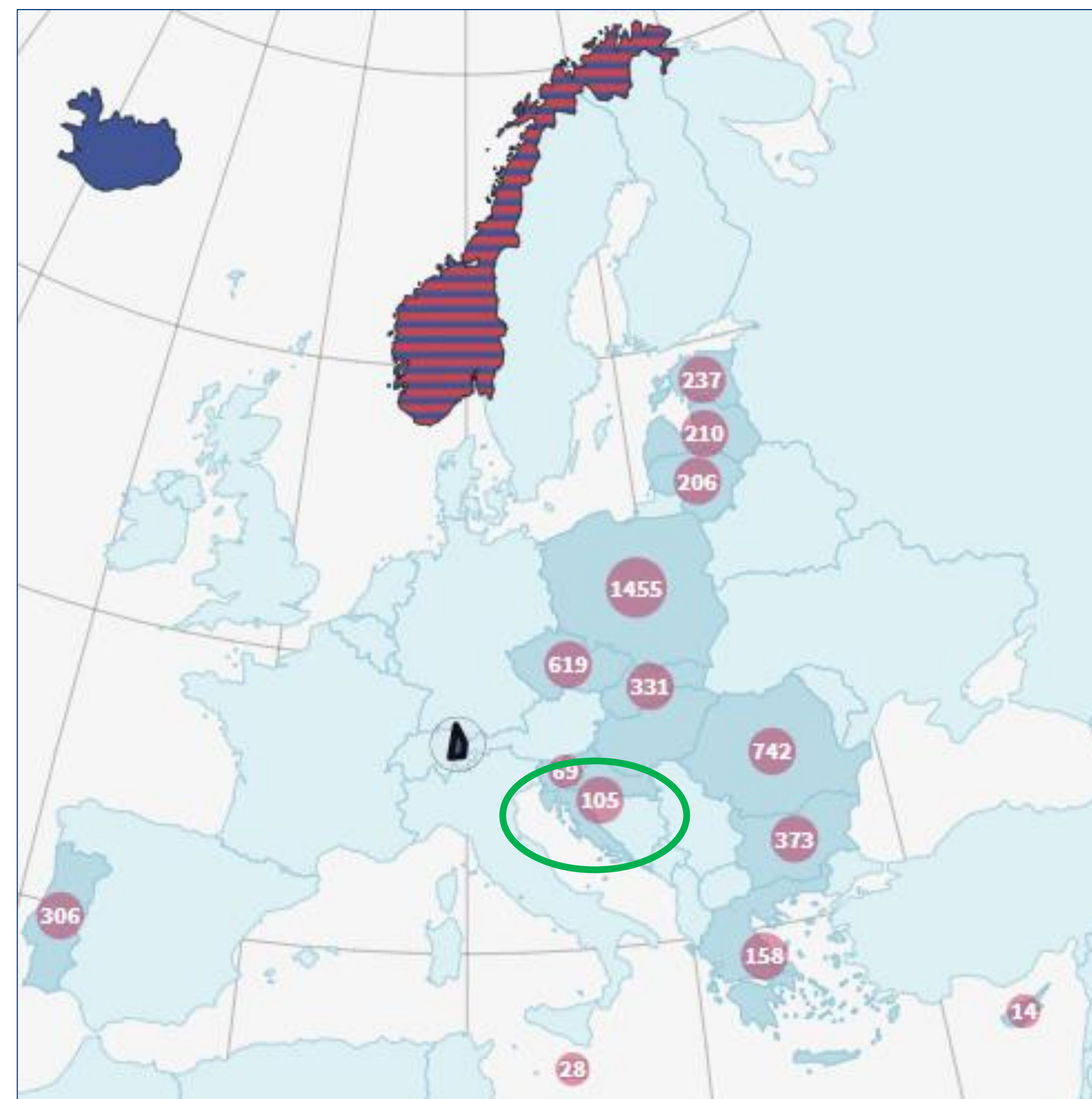
€1 546 082 432 EEA Grants and €1 251 599 189 Norway Grants

Projects by sector

No filter selected



Justice and home affairs	126 projects
Innovation, research, education and competitiveness	1 450 projects
Social inclusion, youth employment and poverty reduction	373 projects
Environment, energy, climate change and low carbon economy	489 projects
Culture, civil society, good governance, fundamental rights and freedoms	2 417 projects
Regional cooperation	19 projects
Youth Employment	34 projects



Croatia total - EEA Grant within the EEA Agreement

Projects funding by Financial Mechanism 2014-2021, number of projects

Our Partners

Financial Mechanisms 2014-2021

No filter selected



■ EEA Grants ■ Norway Grants

Donor Partner Programmes by sector

No filter selected



■ Justice and home affairs
 ■ Innovation, research, education and competitiveness
 ■ Social inclusion, youth employment and poverty reduction
 ■ Environment, energy, climate change and low carbon economy
 ■ Culture, civil society, good governance, fundamental rights and freedoms

Donor Programme Partners

No filter selected

Donor State	Organisations	Countries	Programmes
► Norway	3	1	3
Total	3	1	3

Donor project partners

Donor State	Organisations	Countries	Programmes	Projects
▼ Iceland	12	1	3	27
Citizens Foundation Iceland		1	1	3
Department of Education and Youth		1	2	2
EFLA h.f.		1	1	8
Einrud ltd. Reykjavik		1	1	1
Geocamp Iceland ehf		1	2	5
Iceland GeoSurvey (ISOR)		1	1	1
Icelandic Women's Rights Association		1	1	2
Institute of Foreign Languages, University of Island, Roma in the Centre Initiative		1	1	1
InterCultural Iceland		1	1	1
The Women's Shelter		1	1	1
University of Akureyri		1	1	1
Women's Counselling		1	1	1
► Norway	63	1	6	84
Total	75	1	6	111

Network map

Show: Donor Programme Partners Donor project partners



Partners by Donor State

No filter selected



Croatia - Environment, energy, climate change and low carbon economy

This project was a part of bilateral relations at a national level between the Donor States of the EEA Grants and Croatia. The project was ongoing from April 2016 to June 2017, and it was meant to promote the development of cooperation in geothermal energy between Iceland and Croatia.

The national focal point was the Croatian Ministry of Regional Development and EU Funds. The Beneficiary/Applicant was the Energy Institute Hrvoje Požar (EIHP) and the person managing the project on the behalf of the EIHP was Danica Maljković with her team.

The Project Partner was the Icelandic National Energy Authority, and the person managing the project was Jón Ragnar Guðmundsson.

Geothermal resources and district heating experts were J. Rúnar Magnússon, from EFLA Consulting Engineers, and his team.

Geothermal Energy Utilisation Potential in Croatia

Field and Study Visits' Report



Croatia - Environment, energy, climate change and low carbon economy

Projects funding by Financial Mechanism 2014-2021, number of projects

Our Partners

Financial Mechanisms 2014-2021

No filter selected



■ EEA Grants ■ Norway Grants

Donor Partner Programmes by sector

Environment, energy, climate change and low carbon economy



■ Environment, energy, climate change and low carbon economy

■ Renewable Energy, Energy Efficiency, Energy Security

Donor Programme Partners

No filter selected

Donor State	Organisations	Countries	Programmes
▶ Norway	1	1	1
Total	1	1	1

Donor project partners

Donor State	Organisations	Countries	Programmes	Projects
▼ Iceland	3	1	1	10
EFLA h.f.		1	1	8
Geocamp Iceland ehf		1	1	1
Iceland GeoSurvey (ÍSOR)		1	1	1
▶ Norway	9	1	1	13
Total	12	1	1	23

Network map

Show: Donor Programme Partners Donor project partners



Partners by Donor State

No filter selected

■ Donor Programme Partners ¹ ■ Donor project partners ¹²



2.

GEO THERMICA





Increasing the pace of coordinated Research and Innovation in Geothermal Energy

Presentation date: 19/10/2022



GEOthermica has received co-funding from the European Union's Horizon 2020 research and innovation program under grant agreement No 731117.



GEOHERMICA

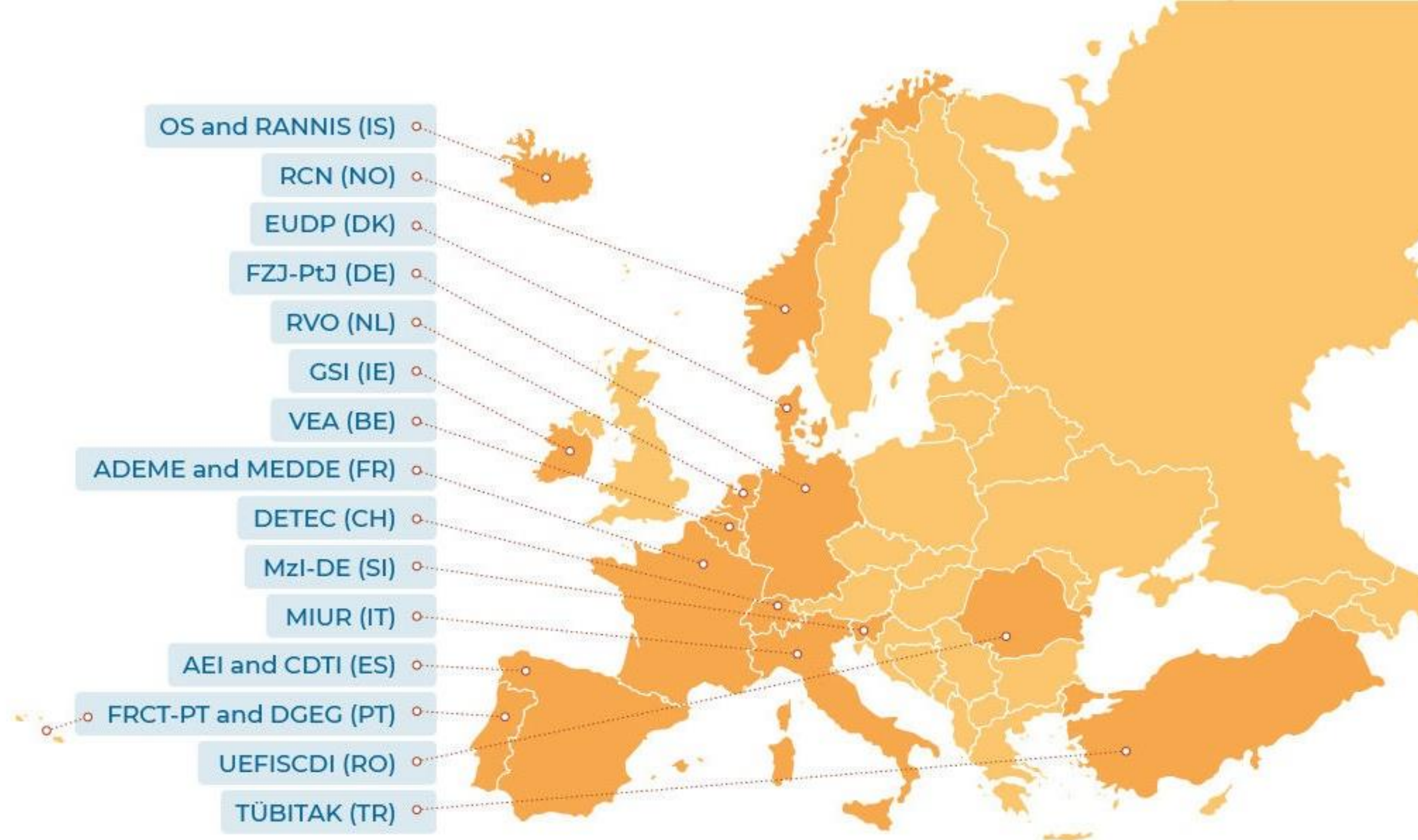
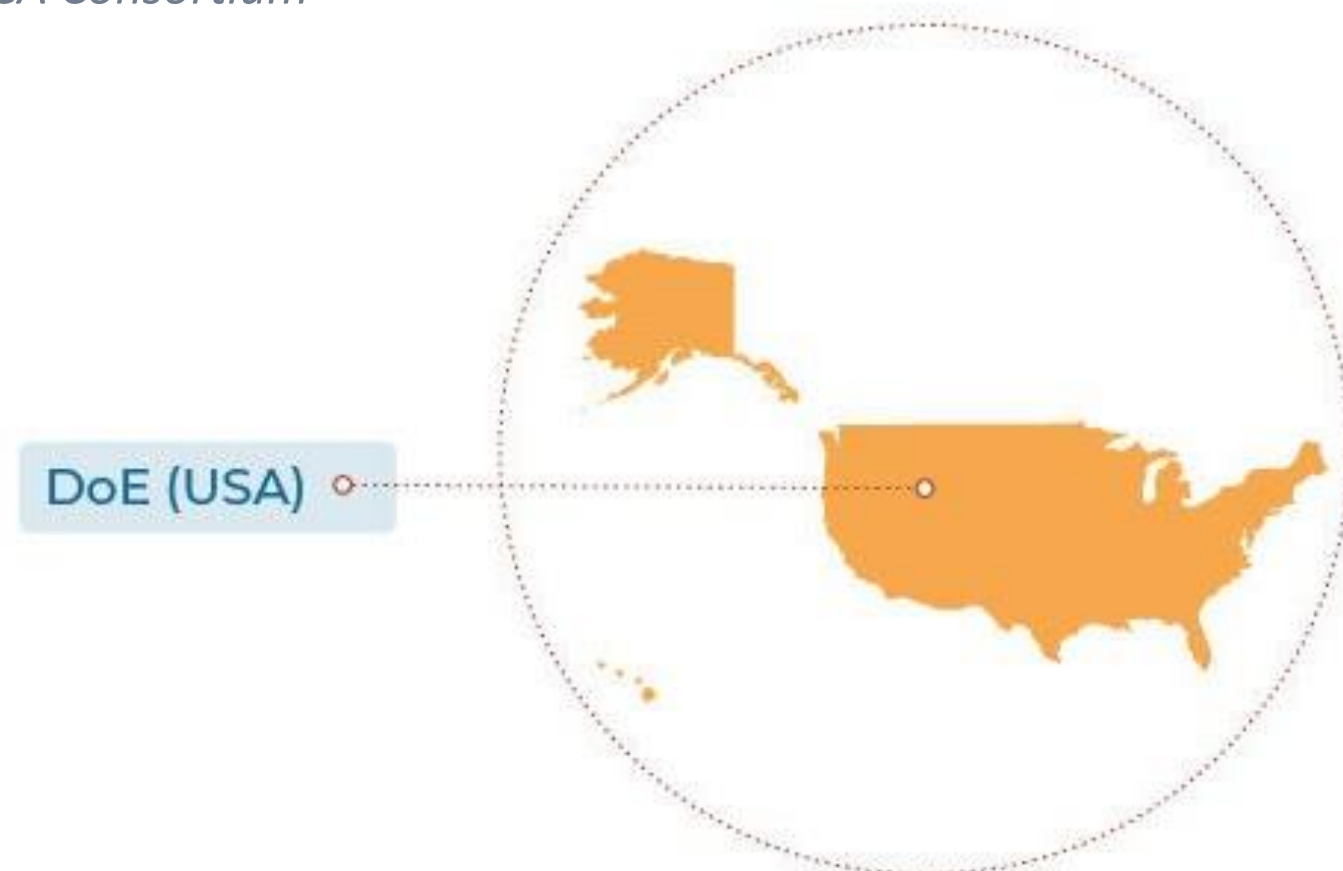


Figure: GEOTHERMICA Consortium



- Initiated as Geothermal ERA-NET 2012-2016 by Iceland, Netherlands, Germany, Italy & Switzerland
- Pooling national and EC funds for research and innovation
- Focusing on accelerating geothermal development
- Establishing a long-lasting strategic collaboration
- Influence the development of geothermal energy worldwide

3. EDUCATION





PROGR/

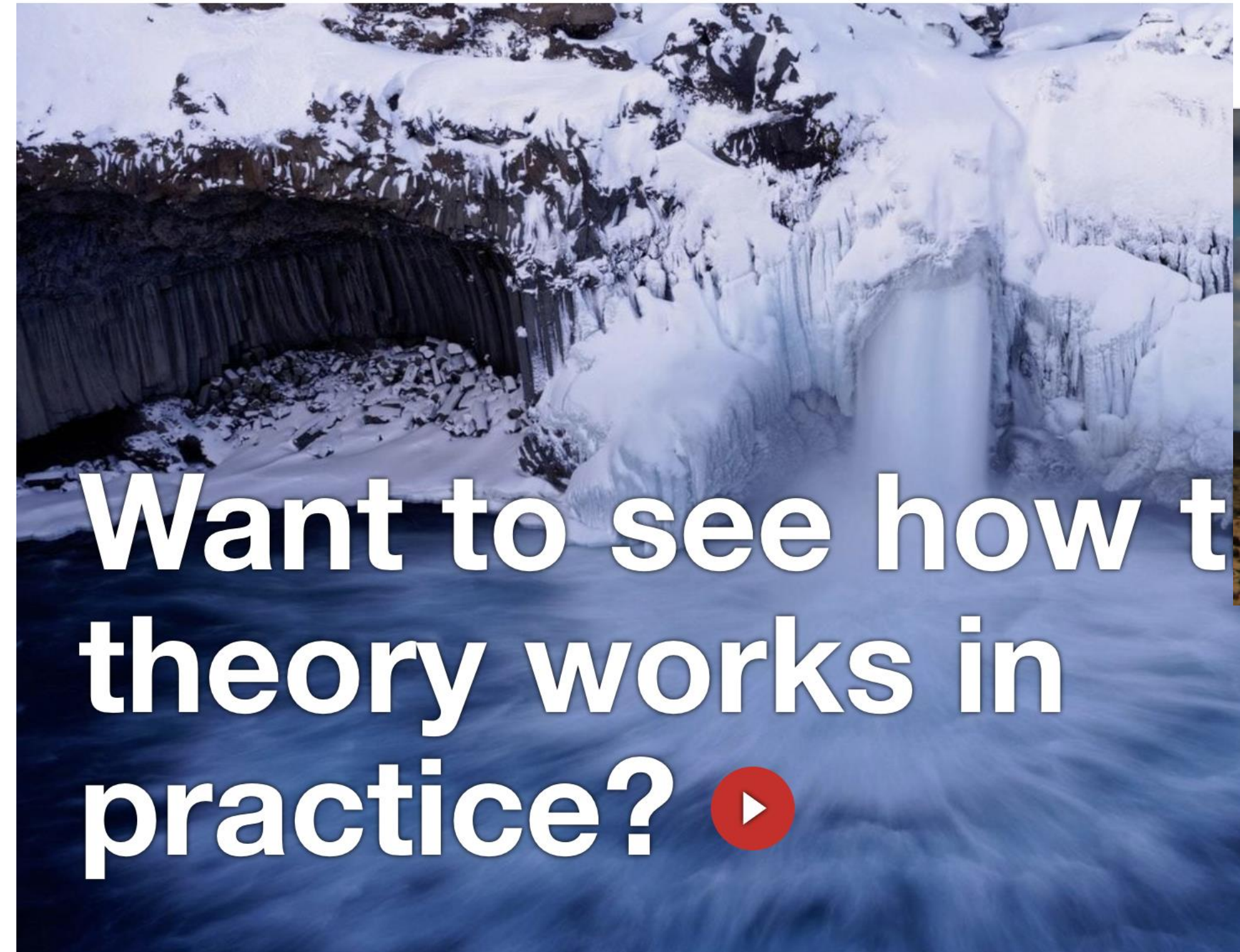


United Nations
Educational, Scientific and
Cultural Organization

GRO
GTP

- Geothermal Training Programme
- Under the auspices of UNESCO

About GTP

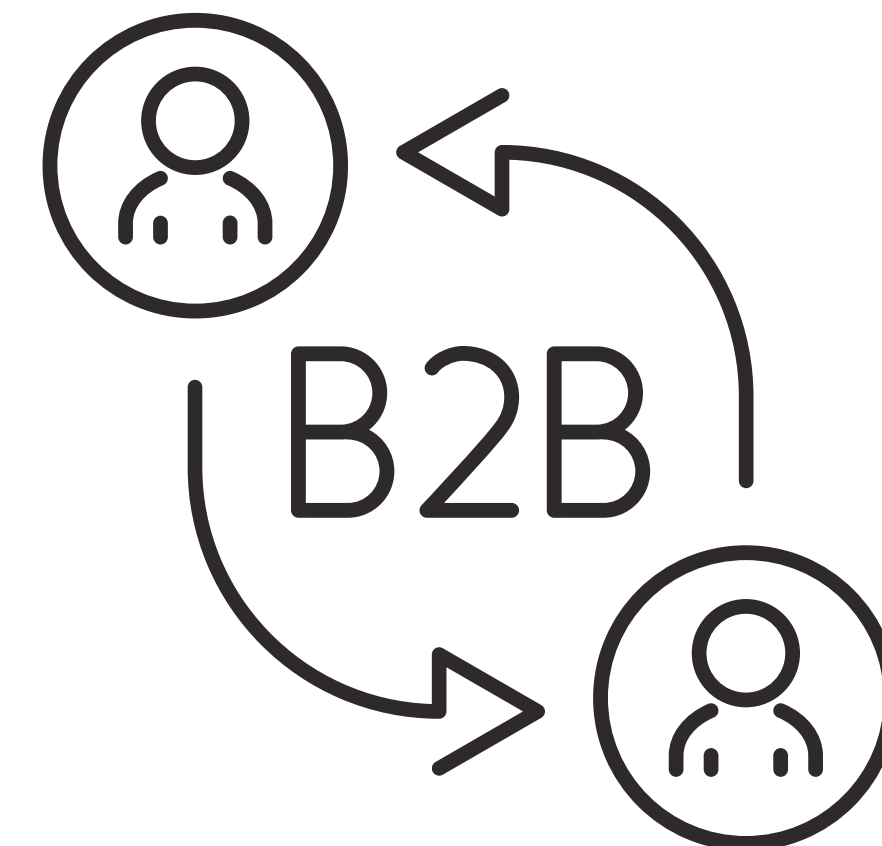


Want to see how t
theory works in
practice? ▶



Geothermal Training Programme
under the auspices of UNESCO

4. Business to Business Collaboration



Geothermal

Wednesday
22 Mar 2023



Croatia Announces New Geothermal Blocks for Tender

🕒 22 Mar 2023 by thinkgeoenergy



Business to Business Collaboration



EEA grants

GEOTHERMICA

Education



THANK YOU